

Study on the Impact of Cross-border Capital Flows on Income Inequality

-- Empirical Test Based on System GMM

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Abstract: The impact of economic globalization on income inequality has always been the focus of development economics research. The process of globalization in the past few decades shows that economic globalization is mainly the globalization of commodity trade and the globalization of capital flow. This paper mainly studies the impact of cross-border capital flows on income inequality, using cross-border panel data from 109 countries or regions from 1973 to 2015, and using the systematic GMM method to study the impact of cross-border capital flows on income inequality under different financial depths, and finally put forward policy recommendations to improve income inequality.

Keywords: Cross-border capital flows, Income inequality, Systematic GMM models.

1. Introduction

In recent years, with the continuous development of world economic integration and the deepening of financial globalization, cross-border capital flows between countries have become increasingly frequent. Therefore, research on the impact of capital account opening on the economy and finance has become a topic of interest. Regarding the impact of cross-border capital flows on the economy and finance, there are mainly two views in the research community. Some scholars believe that the flow of cross-border capital is conducive to the growth of their own economy, while others believe that the opening of the capital account will make the country's ability to resist risks. In the face of financial crises, the domestic economy is vulnerable to shocks, resulting in social instability.

From the existing research, there is a correlation between cross-border capital flow and income inequality. Due to the continuous development of economic globalization, many emerging countries continue to increase the degree of financial openness. With the continuous development and improvement of financial markets, the income gap between developed economies and backward economies is also gradually widening. With the deepening of research, scholars mainly hold two views. Some scholars believe that the opening of the capital account has a catalytic effect on boosting the economy and investment. By promoting the development of the financial market, it can improve the economic efficiency of the country, thereby reducing the consumption expenditure of low-income people in financial services and improving living conditions. Under the conditions of financial openness, they can live with higher returns than high-income groups. Some scholars have found through theoretical and empirical research that the opening of the capital account will exacerbate income inequality, thereby reducing the ability of the domestic financial market to be lower than international financial risks, slowing down the speed of economic development, thereby reducing social

welfare and leading to income inequality. exacerbated. All in all, it is worth continuing to explore whether the opening of the capital account has an impact on the country's income gap widening or narrowing.

2. Literature Review

Whether it is the research results of various scholars or the reality of various countries, the opening of the capital account will indeed have an impact on a country's national income, but what follows is whether different residents can share the benefits brought about by the opening of the capital account. The benefits of increased national income or the sharing of risks, that is, whether the opening of the capital account will affect a country's income distribution and have an impact on income inequality. Ang (2010) took India as a research object, and found through empirical research that opening the capital account would increase the country's income inequality, and his research showed that the development of financial markets can effectively reduce income inequality. The research of Jaumotte et al. (2013) shows that trade globalization is conducive to reducing income inequality, while financial globalization may increase income inequality. Larrain (2015) finds that capital account opening increases wage inequality between skilled and unskilled workers, and this effect should be greater especially for firms that rely heavily on external financing and firms with strong complementarity of capital and skills. Bumann and Lensink (2016) argue that the impact of capital account liberalization on income inequality depends on financial depth. Capital account liberalization reduces income inequality if financial depth exceeds 25 percent. Furceri and Loungani et al. (2018) revisit the aggregate and distributive effects of financial globalization policies and show that these policies lead to limited output growth and significant increases in inequality.

There is relatively little domestic literature on the impact of capital account opening on income inequality. Rexin (2014) believes that the continuous improvement of financial

openness will increase the income of both low-skilled labor and high-skilled labor, but not proportionally, and opening the capital account will lead to a larger increase in the wage level of high-skilled labor, thereby increasing income inequality. Wang Na (2016) believes that capital account opening will affect income inequality through three channels. The first is the investment channel of enterprises. The increased income of enterprise investment brought about by the opening of the capital account will only go to a small number of capital owners, and the vast majority of ordinary workers may suffer as a result. The second is the channel of government spending. The opening of the capital account will increase the government's spending on managing capital flows, thereby reducing the government's available spending on social security. In addition, after the opening of the capital account, in order to attract capital inflows, the government may also take measures to reduce capital taxation, so that the tax burden falls on laborers and aggravates social income inequality. The third is the financial crisis channel. The opening of the capital account may trigger a crisis, causing damage to small and medium-sized enterprises with low risk tolerance, reducing the wage level of ordinary workers and even losing their jobs. Yu Dan (2018) argues that opening the capital account will increase a country's income inequality, and this effect is more pronounced in developing countries. In terms of influence channels, capital account opening will affect income inequality through two channels: the financial market and the triggering of crises. When the level of financial market development is low and the financial crisis period, the opening of the capital account will have a stronger effect on aggravating income inequality. Mei Dongzhou and Wang Siqing et al. (2019) believe that opening the capital account will indeed lead to a rise in income inequality, but the intensity of this effect varies in different countries, especially for non-OECD countries. effect is more intense. In terms of transmission channels, they believe that the capital flow caused by the opening of the capital account will flow more to high-tech industries in non-OECD countries, which will lead to an increase in the demand for high-skilled workers, making the already higher The rise in the wages of highly skilled labor at the income level further exacerbates income inequality, but this effect will also be weakened by the adjustment of income redistribution policies.

To sum up, issues related to capital account liberalization have always been a key topic in the field of international finance. Therefore, based on the aforementioned research, this paper incorporates financial depth into the research scope, and explores the link between cross-border capital flows and income inequality by analyzing data from 109 sample countries.

3. Variables, Data Sources and Model Building

3.1. Variables and Data Sources

The sample used in this paper consists of 109 countries, including developed, developing and lagging countries. Each country has different levels of capital account openness, levels of financial depth and different levels of income inequality. The sample data in this paper are observations taken every five years, starting in 2015 and going forward. The details are shown in Table 1.

Table 1. Sample country

Albania	Germany	Pakistan
Argentina	Ghana	Panama
Anmenia	Greece	Papua New Guinea
Australia	Guatemala.	Paraguay
Austria	Honduras	Peru
Bangladesh	Hong Kong	Philippines.
Barbados	Hungary	Poland
Belgium	Iceland	Portugal
Belize	India	Qatar
Bolivia	Indonesia	Russian Federation
Botswana	Iran	Rwanda
Brazil	Ireland	Senegal
Bulgaria	Israel	Singapore
Burndi	Italy	Slovak Republic
Cambodia	Japan	Slovenia
Cameroon	Jordan	South Africa
Canada	Kazakhstan	Spain
Central African Republic	Kenya	SriLanka.
Chile	Korea	Sudan
Colombia	Kuwait	Swaziland
Congo Republic	Kyrgyz Republic	Sweden
Costa Rica	Latvia	Switzerland
Coted'Ivoire.	Lesotho	Syrian Arab Republic
Croatia	Lithuania.	Tanzania
Cyprus	Malawi	Thailand
Czech Republic	Malaysia	Togo
Denmark	Malta	Tonga
Dominican Republic	Mauritis	Trinidadand Tobago
Ecuador	Mexico	Tunisia
Egypt	Moldova	Turkey
E1Salvador	Mongolia	Uganda
Estonia	Morocco	United Kingdom
Fiji	Mozambique	United States
Finland	Nepal	Uruguay
France.	Netherlands	Venezuela
Gabon	New Zealand	Yemen
Gambia	Norway	Zambia

This paper uses the Gini coefficient as a measure of income inequality, which was published by Galbraith and Kum in 2005. The cross-border capital flow indicator is represented using the Capital Account Openness Index (KAOPEN) created by Chinn and Ito. Financial depth represents the level of financial development of a country or region. The higher the financial depth, the higher the level of financialization of a country and the better the level of financial services. The variables used are detailed in Table 2.

The Gini coefficient is expressed as a percentage between 0 and 1. When the Gini coefficient is 0, it means that the income level of a country is completely equal. When the Gini coefficient is equal to 1, it means that the income of the region is completely unequal, that is to say , a larger Gini coefficient indicates a larger income inequality, and the country has a larger income gap. Generally speaking, the Gini coefficient of a country is between 0 and 1.

In order to make the empirical results more robust, the following variables are used as control variables, including per capita GDP growth rate, real GDP growth rate, secondary school enrollment rate, proportion of industrial added value, industrial employment rate, population growth rate of a country, elderly people of a country ratio, the proportion of government consumption expenditure, etc.

Table 2. Variable description

variable	variable name	definition
Gini	Gini Coefficient	The higher the Gini coefficient, the higher the inequality
Findepth	Financial depth	Private Credit/GDP
K aopen	Capital account opening	Standardized capital control index
Govcost	government consumption expenditure	Government consumption expenditure as a percentage of GDP
Industry add ratio	industrial added value	Industrial added value as a percentage of GDP
Industry employment	industry employment rate	Employment rates in primary and secondary industries
GDP per capita	GDP per capita growth rate	Use the value of real GDP per capita to measure
GDP growth	GDP growth rate	Annual real GDP growth rate
Age dependency ratio	old age care ratio	The elderly as a share of the labor force
schooling	education spending	Proportion of government spending on education
Population growth	population growth	annual population growth rate

The specific data sources are as follows: Income inequality data comes from UTIP (University of Texas Inequality Project). The capital account open data is derived from the Chinn and Ito Index database. Financial in-depth data, per capita GDP data, real GDP growth rate, secondary school enrollment rate, proportion of industrial added value, industrial employment rate, population growth rate of a country, elderly care ratio of a country, proportion of government consumption expenditure data from the World Bank The World Development Indicators (WDI) database.

3.2. Empirical Model Setting

This paper selects the data of 109 sample countries from 1973 to 2015, and adopts the dynamic panel data model. The specific regression model is as follows:

$$\begin{aligned} Inequality_{i,t} = & constant + \rho inequality_{i,t-1} + \lambda flib_{i,t} \\ & + \theta findepth_{i,t} \\ & + \sigma (flib * findepth_{i,t-1}) + \gamma Control_{it} \\ & + \eta_i + \mu_t + \varepsilon_{it} \end{aligned}$$

Among them, t and i represent time and country respectively; the variable $Inequality_{i,t}$ represents income inequality; there is a lag term of income inequality on the right side of the equation, and the variable $flib_{i,t}$ Indicates the opening of the capital account; the variable $findepth_{i,t}$ represents the financial depth, and the variable $findepth_{i,t-1}$ represents the financial depth lag by one period; and there are also financial depth lag one period and capital account opening ; $Control_{it}$ contains a series of control variables: inflation, trade openness, secondary school enrolment, population growth, juvenile-old care ratio and per capita GDP growth rate; η_i and μ_t represent country fixed effects, respectively and time fixed effects. Finally, we assume that the error term ε_{it} has zero mean in the regression.

This study adopted a systematic GMM (sys-GMM) approach to control for possible endogeneity problems. We will use five-yearly panel data for our estimates, which means we take observations every five years. We prefer this approach rather than five-year averages, as averaging results in serial correlations that make consistent estimates more difficult. As suggested by Roodman (2009), we added time fixed effects to control for the correlation between individuals in the error term. Finally, we apply a Windmeijer (2005) correction to our standard errors to correct for finite sample bias in two-step standard errors.

3.3. Descriptive Statistical Analysis

Table 3 provides descriptive statistics on capital account openness, financial depth, income inequality, and a range of control variables. As can be seen from the table, the indicators of financial depth vary greatly among countries, ranging from the lowest 0.73 to 246, the capital account opening also varies from negative to positive, and the dependent variable Gini coefficient also has great changes, ranging from 0.73 to 246. 0.12% to 56.8%. Notably, higher enrolment and GDP growth rates reflect a higher level of economic development in the country. And developed countries have lower income inequality indices than less developed countries.

Table 3. Descriptive Statistical Analysis of Variables

Variable	Obs	Mean	Std.Dev.	Min	Max
Inequality	658	0.0509	0.0651	0.0012	0.5681
Flib	879	0.2100	1.5600	-1.9036	2.3744
Findepth	735	43.0800	41.2400	0.7322	246.0320
Per capita GDP growth	887	2.2700	4.8900	-30.1800	53.9438
Age dependency ratio	981	12.1163	7.2313	1.2159	42.6527
schooling	536	4.3832	1.6281	0.8257	12.0797
Population growth	989	1.5617	1.3755	-2.8510	13.0760
Govcost	868	15.6241	5.4414	2.0576	41.9580
Gdpgrowth	887	3.9070	4.8988	-27.5265	57.8179
Industryadd	814	27.9663	10.5546	2.0732	84.7960
Industryem~t	552	21.4433	8.6643	2.1150	57.1630

4. Empirical Analysis

This study uses the generalized estimation of moments econometric estimation method and national panel data to do an empirical study on the effect of capital account opening on

income inequality. On this basis, the interaction terms of financial depth, capital account opening and financial depth are introduced, as well as a series of control variables such as per capita GDP growth rate, real GDP growth rate, secondary school enrollment rate, proportion of industrial added value,

industrial employment rate, a The population growth rate of a country, the elderly care ratio of a country, the proportion of government consumption expenditure, etc., are also included in the research framework. In all regression equations, this paper assumes that the control variables are exogenous, while the measures of capital account opening are endogenous, and they are both linked by shocks to real GDP per capita in current and prior periods. Then this paper uses Stata14 as the econometric analysis software.

Table 4 presents the empirical results of the regression equations for the kaopen index as capital account opening and the gini coefficient as income inequality. In theory, we expect the coefficient of capital account opening and the coefficient of the interaction term between capital account opening and financial depth to be opposite to each other, then financial depth will inhibit the impact of capital account opening on income inequality.

The first column presents a parsimonious model with only the interaction term and its components, with no further control variables. We can see that there is a significant negative correlation of 1% between capital account openness and income inequality, that is, the more open the capital account, the smaller the income inequality gap. The coefficient of the interaction term also has a significant positive correlation of 1%, indicating that higher financial depth will exacerbate the negative effect of capital account opening on income inequality. In the second column I control for the effect of GDP growth rate to determine whether there is a significant correlation between GDP growth rate and any measure of income inequality. We can see that there is a significant negative correlation of 1% between capital account openness and income inequality, that is, the more open the capital account, the smaller the income inequality

gap. The coefficient of the interaction term has a significant positive correlation of 1%, indicating that higher financial depth will increase the negative effect of capital account opening on income inequality, that is, reduce income inequality.

In the third column, other control variables are included, such as real GDP growth rate, secondary school enrollment rate, proportion of industrial added value, industrial employment rate, population growth rate of a country, elderly care ratio of a country, government consumption expenditure specific gravity, etc. We can see that the coefficients for the capital account openness and interaction terms we care about are -0.13 and 0.02, respectively. The significant negative correlation for λ suggests that capital account liberalization tends to reduce income inequality. However, the relationship between capital account liberalization and income inequality will vary with financial depth. The greater the financial depth, the greater the negative impact of capital account opening on income inequality. That is, the higher the financial depth, the greater the income inequality when the capital account is opened. Small. In all regressions, Hansen's test statistic indicated the validity of the over-identification restriction, and there was no evidence of second-order autocorrelation (AR2). In addition, it can be seen from the third column that there is a significant negative correlation of 5% between capital account openness and income inequality, that is, the more open the capital account, the smaller the income inequality gap. The coefficient of the interaction term has a significant positive correlation of 5%, indicating that the higher the financial depth, the stronger the negative effect of capital account opening on income inequality, that is, the higher the financial depth, the more open the capital account, the smaller the income inequality.

Table 4. Capital Account Openness and Income Inequality

Dependent variable: inequality			
	Capital account liberalization		
	(1)	(2)	(3)
L.inequality	0.734*** (131.62)	0.871*** (106.19)	0.865*** (145.83)
flib	-0.337*** (-15.10)	-0.179*** (-13.97)	-0.134** (-2.43)
L.findepth	-0.0535* (-1.71)	0.241*** (5.50)	0.947*** (9.57)
findepth	-0.0186*** (-20.92)	-0.00639*** (-12.37)	-0.0112*** (-5.62)
flib x L.findepth	0.0684** * (15.80)	0.0333*** (13.10)	0.0240** (2.06)
Per capita GDP growth		0.0890*** (11.22)	0.559 (0.64)
Constant	3.681*** (26.66)	-0.111 (-0.54)	0.836*** (3.52)
Control variables	No	No	Yes
Year effects	Yes	Yes	Yes
Observations	349	348	145
Groups	95	94	69
Instruments	133	173	79
Hansen-p value.	0.999	1	1
AR2-p value.	0.904	0.781	1

Note: ***p<0.01, **p<0.05, *p<0.1

5. Conclusion and Suggestion

5.1. Conclusion

The impact of capital account opening on income inequality has received extensive attention over the past two or three decades. Although there are a large number of research results showing that capital account opening has a positive or negative impact on income inequality, few literatures include financial development into the research framework of financial openness and income inequality. In the context of previous studies on the impact of capital account opening on income inequality, this paper proposes that capital account opening will reduce the gap in income inequality in countries with higher financial depth. This paper uses the data of 109 countries from 1973 to 2015, uses the generalized moment estimation method and adds the per capita GDP growth rate, real GDP growth rate, secondary school enrollment rate, proportion of industrial added value, industrial employment rate, and a country's population growth rate, a country's old-age care ratio, and the proportion of government consumption expenditure as control variables to measure the impact of capital account opening on income inequality under the condition of different financial depths.

Empirical analysis shows that the impact of capital account opening on income inequality is affected by the level of financial depth. The results show that when the financial depth is higher, the capital account opening will reduce the level of income inequality, and the lower the financial depth, the capital account opening will increase the level of income inequality. Therefore, this paper argues that not all countries or regions should prohibit the opening of the capital account, but the decision to open the capital account needs to be made prudently. For most developing and backward countries with low financial depth, the opening of the capital account will increase the income inequality gap of the country, so in order to ensure the living standard of the poor in those countries, the country should increase the level of capital account opening in the country. The government should take measures to protect those poor people in plight.

5.2. Suggestion

5.2.1. Strengthen Worker Protections

Opening a capital account benefits most capitalists and highly skilled and educated people, and when opening a capital account, opening a capital account does not directly benefit unskilled workers. When financial risks arise and asset prices fall and fluctuate, all the adverse effects usually come into play first. This is difficult and has led to workers staying safe amid the wave of risks posed by the opening of the capital account. As living standards and people's well-being decline, capitalists tend to have greater risk tolerance. So government we need to act in a timely manner to develop policies to help workers affected by capital account opening. The government needs to use it flexibly to prevent workers from incurring greater losses in the process of opening a capital account. Look at the hands that protect ordinary workers.

5.2.2. Improve China's Financial System

The above research proves that the higher the level of financial development of a country, the more open the capital account, and the smaller the capital account. Income Gap. Therefore, the more perfect a country's financial market access system is, the lower the level of corruption. The more complete the applicable laws and regulations, the more

complete the performance and spirit of the contract, and the better the capital account at the time of opening. The negative impact will be less. Therefore, China must speed up the improvement of its financial system, and China's interest rate and foreign exchange market will speed up the establishment of a fair, sound, stable and transparent financial system.

5.2.3. Increase Support for SMEs

For micro-enterprises, the government needs to increase support and formulate corresponding policies. Enhance the ability of small and medium-sized enterprises to resist risks. Capital account liberalization to eliminate risks cannot be achieved overnight, and both macro and micro entities need to take corresponding steps. The biggest difficulty facing medium-sized and medium-sized enterprises is financing difficulty. The government should relax the financing and loan policy for small and medium-sized enterprises and improve the financial environment. The climate of capital transactions and diverse investments unleashes the potential, innovation and creativity of companies, injecting strong certainty into the economy. Heart Proxy. In addition, there are many small and medium-sized enterprises, which can provide many employment and employment opportunities. Increase social well-being, maintain social stability and unity, and benefit low-income groups of income inequality between them and others.

5.2.4. Maintain Financial Stability and Avoid Financial Crises

We need to guarantee financial stability and avoid inflation and financial crises. Since the reform and opening up, my country has experienced repeated inflation, and it is difficult to achieve the impact of inflation on the redistribution of my country's wealth in the past. Although measured, foreign experience tells us that the biggest victims of inflation are the poor. Not only that, inflation and financial crises can seriously damage the entire economy, not just the poor. Only by ensuring financial stability can the economy develop conditions and improve income distribution.

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